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SOME NEW OR LITTLE KNOWN FORMS OF NEW ENGLAND TREES.

ALFRED REHDER.

THE following descriptions of some little known varieties and forms of trees are presented here chiefly for the purpose of drawing the attention of collecting botanists to these variations. Trees and particularly the more common trees are often passed by by botanists, and therefore are usually not well represented in our collections, a fact that makes it difficult to trace the frequency of unexpected forms. We have still much to learn even in a so comparatively well explored region as New England in regard to the distribution of certain varieties and the frequency of the occurrence of certain forms of trees. That forms like the virgate form of the Red Spruce and the cut-leaved forms of Sumach due to spontaneous mutation may occur repeatedly and independently, has been shown by the observation made in Europe on allied species. We also may be on the look out for similar forms in other species or genera.

Picea mariana var. ***brevifolia*** comb. nov.—*P. brevifolia* Peck, Spruces of the Adirondacks, 13 (1897); Britton, Ill. Flor. 3: 496 fig. 122a (1898); Man. 34 (1901); Brotherton, Amer. Gard. 21: 201, 2 fig. (1900).—*P. nigra* var. *brevifolia* Rehder, Bailey's Cycl. Am. Hort. 3: 1334 (1901).

Differs from the type chiefly in its smaller glaucous leaves. It is a small tree, rarely exceeding 10 m. in height with a narrow spire-like head of irregular outline; leaves 4–12 mm. long, stout, obtuse or mucronate, glaucous; cones 1.2–2.5 cm. long, the scales with erose margins; seeds 2 mm. long, with wings 4–5 mm. in length.

This variety is credited by Britton to Vermont, but I fail to find

in the herbariums consulted any specimens from this state. There are, however, the following specimens from Maine and New Hampshire which are referable to this variety. MAINE: Bangor bog, Orono, July 20, 1892, *M. L. Fernald*; Somerset Co., peat bog, Flagstaff, Aug. 19, 1896, *M. L. Fernald*; Piscataquis Co., Mt. Ktaadn, July 8, 1900, *J. R. Churchill*. NEW HAMPSHIRE: summit of Thorn Mtn., Jackson, Oct. 4, 1896, *C. E. Faxon*. *Picea mariana* var. *brevifolia* inhabits chiefly mountain bogs and is distributed outside of New England to Ontario, northern New York and Michigan. The low prostrate form of the exposed tops of high mountains described by Peck as *P. brevifolia* var. *semiprostrata*, will probably also be found in New England. A form similar in habit and in the size of leaves and cones which I found on top of Mt. Mansfield in Vermont is apparently a low form of the true *P. mariana*, as it has dark green leaves.

Picea rubra* forma *virgata comb. nov.—*Picea mariana* “monstrous form” Gard. & Forest 8: 45 fig. (1895).—*Picea rubens* “form” Sargent, Sylv. N. Am. 12: 33 (1898).—*Picea nigra* var. *virgata* Rehder; Bailey’s Cycl. Am. Hort. 3: 1334 (1901).

Differs from the type by the long and slender branches entirely destitute of branchlets.

MASSACHUSETTS: on the base of Mt. Hopkins near Williamstown, one plant found by Mr. George Walker and specimens with a photograph sent by Samuel F. Clarke in 1894 to the Arnold Arboretum.

A very peculiar looking Spruce and interesting as a parallel form to ***P. Abies* f. *virgata*** (*P. excelsa* var. *virgata* Caspary), Schlangenfichte (Snake-Spruce), found in quite a number of localities in central and northern Europe, particularly in Norway. A comparison of the figure given in Garden & Forest (l. c.) of the “snake” form of *P. rubra* and of the figures of *P. Abies* f. *virgata* published by Carrière (Rev. Hort. 1854: 102) and by Schübeler (Viridarium Norwegicum 1: 411, fig. 69. 1886 and Gartenfl. 1: 521. 1887) show that there is hardly any difference in habit between these forms of the two species. It may be reasonably expected, that other plants of this form of *P. rubra* will be discovered in time, as the European Snake-Spruce also has been found many times, usually only in single plants which undoubtedly originated independently by mutation, and sometimes in colonies; in the latter case they were probably seedlings of a single mother tree. The offspring of the Snake-Spruce represents partly the true snake form and partly forms intermediate

between this form and the type of the species; such was at least the case in a number of seedling plants I saw in the park at Reinhardtsbrunn in the Thuringian Mountains. Trees propagated by grafting are planted occasionally in European gardens. *Picea rubra* f. *virgata* may now likewise be found in some gardens, for Prof. S. F. Clarke stated in a letter to Prof. C. S. Sargent, that Mr. G. Walker made cuttings of this Spruce. A grafted plant of this form lived in the Arnold Arboretum for years but died unfortunately a few years ago.

BETULA LENTA L. forma **laciniata** f. n.—*Betula lenta* "form"
Sanford, RHODORA 4: 83. (1902.)

A typo differt foliis inciso-lobatis, lobis utrinque 6–9 argute serratis, inferioribus circa 1 cm. longis apicem versus decipientibus et in serraturas angustas acuminis transeuntibus.

Differs from the type by the incisely lobed leaves. Leaves 6–8 cm. long, subcordate or truncate at the base, long acuminate on each side with 6–9 ovate-lanceolate, sharply serrate and acuminate lobes, the lower ones about 1 cm. long and gradually passing into the sharply serrate apex.

NEW HAMPSHIRE: New Boston, Aug. 1901, S. N. F. Sanford (Herb. Gray) and July 31, 1902, E. W. Morse, (Herb. Arnold Arboretum).

This is interesting as a parallel form to the Old World *Betula pendula* f. *dalecarlica* (L.) C. K. Schneider and *Betula alba* var. *urticifolia* Regel, both of which have been repeatedly found wild in Scandinavia. Of the form here described only a single tree of about 12 feet height has been found by Mr. Sanford near New Boston at an altitude of about 1200 feet as stated by him in the article referred to above. Judging from his description as well as from the specimens the tree possesses ornamental qualities which would make its introduction into our gardens desirable. This could be easily accomplished by grafting and this would be done at the Arnold Arboretum, if branches were sent late in fall or during the winter to this institution.

FAGUS GRANDIFOLIA Ehrh. forma **pubescens** Fernald & Rehder, f. n.

A typo differt foliis subtus tota facie pilosis sed marginem versus saepe glabrescentibus, ad venas villosis.

Differs from the type in having the under side of the leaves short-pubescent, but toward the margin often glabrescent and the veins covered with a villous pubescence, not with long silky hairs.

MASSACHUSETTS: South Braintree, May 30, 1907 and Bee Hill near Williamstown, June 28, 1904, *Alfred Rehder*. RHODE ISLAND: Tiverton, Aug. 1879, *C. S. Sargent*. In cultivation at the Arnold Arboretum and also in Germany: Muskau (Silesia), Arboretum, July 23, 1901, *Alfred Rehder*.

The specimen from Rhode Island approaches the southern form by its very broad leaves and the somewhat shorter prickles. The specimens from the Arnold Arboretum from Muskau, which lack the fruits, are more densely pubescent than the other specimens and very like the pubescent form of the southern variety, but the foliage is that of the northern form.

Though the American Beech is usually considered a very homogenous species, the comparison of a large amount of material from the whole range of the species shows that this is not the case and that some authors, particularly the younger Michaux, have shown a very good judgment in distinguishing a northern and a southern Beech and that furthermore the description by some old authors as Aiton and Willdenow of the leaves as tomentose or pubescent beneath was quite correct as regards the technical meaning of these words and did not refer to the silky hairs of the young leaves. My attention was first drawn to these variations when I found several years ago a pubescent form in cultivation in Germany. As I recently consulted the Gray Herbarium with the intention to pursue the matter further, I learned from Professor Fernald that he also had made investigations in this respect, the results of which proved almost identical with the conclusions I had reached.

The distinction of the two geographical varieties with pubescent and glabrous forms presents no difficulties, but the nomenclature seems somewhat complicated. During the nomenclatural unrest of the two last decades the names *F. americana*, *F. atropunicea*, and *F. latifolia*, combinations based on older trinomials, had been substituted for the well known *F. ferruginea* by various American authors, but according to the Vienna rules the oldest binomial available is *F. grandifolia* of Ehrhart, which is one year older than Aiton's *F. ferruginea*. By this nomenclatorial change we avoid the rather awkward situation that a very rare form should constitute the type of this widely distributed American tree, for *F. ferruginea* Aiton is apparently based on one of the hitherto almost unknown pubescent forms of the Beech. This is shown by the description "foliis subtus tomentosus" in Hortus

Kewensis and still more conclusively by the manuscript of Solander for Aiton's Hortus Kewensis, where the habitat is quoted as "Habitat in Marylandia, Jones, in Pennsylvania Math. Hultgren." The specimen collected by Math. Hultgren in Pennsylvania in 1781 is still in the herbarium of the British Museum and has according to Mr. E. G. Baker, to whom we are indebted for a copy of the manuscript description and a tracing of the specimen, the leaves densely and softly pubescent beneath. From the published description however, it seems as if the species were based on Lee's cultivated plant. Ehrhart's *F. grandifolia* represents apparently the northern form. It was described from cultivated plants and Münchhausen's *F. americana latifolia* and Duroi's *F. sylvatica c. americana latifolia* based also on cultivated plants quoted as synonyms; these were probably of the same origin as Lee's plant, which is, according to Loudon's description and the figure of his *F. ferruginea* var. *latifolia*, the northern form and also according to a specimen in the herbarium of the Arnold Arboretum collected at Kew and labeled *F. ferruginea* var. *latifolia* (C. Lee & Son). The *F. Americana latifolia* of Wangenheim also represents the northern form. Thus the name *F. grandifolia* Ehrh. remains with the northern variety as the type and for the southern variety the first available varietal name is *F. ferruginea* var. *caroliniana* of Loudon. The synonymy and the description of the varieties and forms to be distinguished may be appended here.

FAGUS GRANDIFOLIA Ehrhart, Beytr. Naturk. 3: 22 (1788).—*F. Americana latifolia* Muenchhausen, Hausv. 5: 162 (1770); Wangenheim, Beytr. Forstwiss. 80, pl. 29, fig. 55, (1787).—*F. sylvatica c. Americana latifolia* Duroi, Harbk. Baumz. 1: 269 (1771).—*F. sylvatica atropunicea* Marshall, Arbust. Am. 22 (1785).—*F. sylvatica* Schoepf, Mat. Med. Am. 140 (1787), not Linné.—*F. ferruginea* Aiton, Hort. Kew. 3: 362 (1789); F. A. Michaux, Hist. Arb. Am. 2: 174, pl. 9. (1812); Rafinesque, New Fl. 3: 80 (1836).—*F. sylvestris*, A. Michaux, Flor. Bor. Am. 2: 194 (1803).—*F. sylvatica* β *americana*, Nuttall, Gen. 2: 216 (1818); Emerson, Trees Mass. ed. 2. 180, pl. (1875).—*F. Americana* Sweet, Hort. Brit. 370 (1826); Sargent, Sylv. N. Am. 9: 27, pl. 444 (1896).—*F. ferruginea* var. *latifolia* Loudon, Arb. Frut. Brit. 3: 1980. fig. 1916 (1838).—*F. atropunicea* Sudworth, Bull. Torr. Bot. Club. 20: 42 (1893).—*F. latifolia* Sudworth, Nomencl. Arb. Fl. U. S. 148 (1897).

The type of the species is characterized by the long and slender

prickles, sometimes nearly 1 cm. long, of the usually ashy gray or yellowish tomentose involucre, by the thinner texture and more yellowish green color of the distinctly serrate leaves which are usually cuneate at the base. Of the synonyms quoted above only *F. ferruginea* of Michaux and of Rafinesque and *F. ferruginea latifolia* Loudon refer to this variety as distinguished expressly from the southern variety. It is distributed from Nova Scotia to Ontario and Minnesota and in the mountains as far south as Virginia.

Forma *pubescens* is described above.

Var. **caroliniana** Fernald & Rehder, comb. nov.—*F. sylvatica* Walter, Fl. Carol. 233 (1788).—*F. sylvestris* F. A. Michaux, Hist. Arb. Am. 2: 170, pl. 8. (1812).—*F. rotundifolia* Rafinesque, Atlant. Jour. 177. (1833).—*F. alba* Rafinesque, New. Flor. 3: 80 (1836).—*F. heterophylla* Rafinesque, l. c.—*F. nigra* Rafinesque l. c.—*F. ferruginea* var. *caroliniana* Loudon, Arb. Frut. Brit. 3: 1980 fig. 1915 (1838).—*F. ferruginea* Chapman, Fl. S. U. S. 425 (1860).—*F. americana* Small, Fl. S. E. U. S. 347 (1903).

Differs from the type in the shorter and fewer prickles of the densely rufous-tomentose involucre; and the generally smaller fruits not exceeding the involucre, the broader usually only denticulate leaves, often subcordate at the base, at maturity of firmer texture and of a dull dark bluish green color. The characteristic differences in the fruit between the northern and the southern variety are well brought out by the figures of Michaux; and Rafinesque's description of his *F. ferruginea* as having the "female flowers with many linear smooth bracts" shows that he, too, noticed this character. Distributed from New Jersey to Florida and west to southern Illinois, Missouri and Texas. In the border regions of the range of the northern and southern variety intermediate forms are often found and even in southern New England trees approaching the southern variety occur.

forma **mollis** Fernald & Rehder, f. n.—

Differt a varietate *caroliniana* foliis subtus tota facie dense et molliter pubescentibus.

Differs from the variety *caroliniana* by the densely and softly pubescent under side of the leaves.

FLORIDA: Tallahassee, Leon County, Aug. 7-9, 1895 *Geo. V. Nash* (No. 2339). LOUISIANA: New Orleans, 1832, *Drummond* (no. 318).

The type specimen from Florida has ovate or oval, denticulate

leaves distinctly subcordate at the base, while Drummond's specimen has elliptic-oblong leaves, cuneate at the base, and has no fruits, but from its range it apparently belongs to the southern and not to the northern variety. Whether the type of *F. ferruginea* from Pennsylvania is to be referred to f. *pubescens* or to f. *mollis* which seems more probable, must remain doubtful as long as we do not know the fruits.

RHUS TYPHINA L. forma *LACINIATA* Wood, Am. Bot. Flor. pt. 4: 73. (1870) as var.; Flor. Atlant. 73 (1879).

Differs from the type by the irregularly incisely dentate or incisely lobed leaflets which are ovate-oblong to lanceolate and by the leafy panicles. New Hampshire, near Hanover, 1846, *Dr. Rickau* (erroneously spelled Ricard by Wood). (Herb. Gray.)

Rhus typhina L. forma **dissecta**, nom. n.—*R. typhina* var. *laciniata* Hort. [Manning] ex Rehder, Möller's Deutsch. Gärtner-Zeit. **15**: 211. fig. (1900); Hort. ex Cowell; Bailey's Cycl. Am. Hort. **4**: 1530 (1902).—*R. hirta* var. *laciniata* C. K. Schneider, Ill. Handb. Laubholz. **2**: 154 (1907).

Differs from the type by the bipinnately divided leaves with the leaflets of the second order linear to linear-lanceolate and entire or dentate or sometimes even pinnatifid.

MASSACHUSETTS, locality unknown; found about 15 years ago by J. W. Manning of Reading, Mass. and transplanted into his garden.

A very striking form on account of the graceful feathery appearance of the large (30–45 cm. long) finely dissected leaves. Its ornamental qualities have won for it a place in many American and European gardens particularly in more northern latitudes where the similar but more tender *R. glabra* var. *laciniata* Carr. is not hardy enough.

A few words may be said on the specific name which this species of *Rhus* has to bear. In 1892 Sudworth (Bull. Torr. Bot. Club **19**: 81) proposed for it the new combination *R. hirta* (L.), because Linné, prior to the publication of his *Rhus typhina* (Cent. Plant. **2**: 14. 1756; Amoen. Acad. **4**: 311. 1760) had named the same species *Datisca hirta* (Spec. Plant. **2**: 103. 1753) from an abnormal specimen with the inflorescence reverting into leaves and with partly confluent leaflets (see also Britton, Bull. Torr. Bot. Club **18**: 269). This explains his placing the plant into an entirely wrong genus. The name *R. hirta*, however, cannot be admitted, according to art. 51, 3 of the Vienna rules of nomenclature, as it is based on a monstrosity.

ACER RUBRUM L. var. TRIDENS Wood, Class Book Bot. 286. (1860); Am. Bot. Flor. pt. 4: 74. (1870); Flor. Atlant. 24. (1879); Sargent, Sylva N. Am. 13: 11, pl. 626 (1902).—*A. rubrum* var. β Torrey & Gray, Flor. N. Am. 1: 249 (1838).—*A. microphyllum* Pax, Bot. Jahrb. 7: 180 (1886).—*A. semiorbiculatum* Pax. l. c. 181.—*A. rubrum* subsp. *microphyllum* Wesmael, Bull. Soc. Bot. Belg. 29: 29 (1890); Schwerin, Gartenfl. 42: 166 (1893) as forma — *A. rubrum* subspec. *microphyllum* Wesmael, l. c.; Schwerin, l. c. fig. 38, as forma; Pax, Engler's Pflanzenreich IV. 163: 38 (1902) as forma — *A. tomentosum* Pax, Engler's Pflanzenreich IV. 163: 38 (1902), not Desfontaines¹ and excl. syn. Marshall² and Kirchner.³

Differs from the type by having smaller leaves usually only 4 to 8 cm. long and obovate in outline, three-lobed at the apex and narrowed from below the middle into the rounded base, usually very glaucous beneath and with long-persistent pubescence, and thick and firm at maturity. The flowers are sometimes yellow and the fruits usually smaller.

MASSACHUSETTS: near Auburndale, May 17, 1904, *M. L. Fernald & Alfred Rehder*. Only one rather large tree was found. This is the most northern locality yet observed for the variety whose range extends south along the Atlantic coast through Florida into eastern Texas.

In its characteristic form the variety appears well marked, but intermediate states are often met with and three-lobed leaves are occasionally found on trees of the typical form and particularly on stunted trees growing in swamps. In the south occurs a still more

¹ The quotation Desfontaines, Tabl. Écol. Bot. ed. 3 (1829) 136 as given by Pax and also in the Index Kewensis is incorrect; the name without any description appears only in edition 1 (1804) p. 136; in the second and third edition this name and likewise the preceding name *A. coccineum* is omitted and for these two names *A. eriocarpum* Michaux substituted. From this it may be inferred that Desfontaines intended the name *tomentosum* for *A. saccharinum*, but even if an herbarium specimen should still exist and should represent the variety *tridens*, the name cannot be revived as it is indisputably a nomen nudum.

² The quotation of Marshall's *A. glaucum* as a synonym of *A. tomentosum* appears to be hardly more than a guess, for Marshall's very vague description does not even clearly show whether he had *A. rubrum* or *A. saccharinum* in mind.

³ As Kirchner in his short description of *Acer rubrum* var. *tomentosum* (Arb. Muscov. 186. 1864) does not mention the most obvious character, the three-lobed leaves, and as also Count Schwerin, who made a most careful study of the cultivated Maples, describes and figures it as a variety with deeply five-lobed leaves (Gartenfl. 42: 165 fig. 50. 1893) chiefly distinguished by the persistent pubescence of the under side of the leaves and the intensely red flowers, I do not think it advisable to consider Kirchner's name as a synonym of var. *tridens*.

extreme form in which the two lateral lobes are reduced to large teeth, so that the leaves appear undivided and only coarsely dentate and are then ovate to ovate-oblong in shape. To this form belong the following two specimens: FLORIDA, *Chapman* (herb. Gray) and MISSISSIPPI, *Enterprise* May 6, 1880 (herb. Arnold Arboretum). Considering the sporadic distribution of the variety *tridens* through the range of the species and the inconstancy of its characters as is clearly shown by a large number of specimens, one cannot consent to its elevation to specific rank, as was done by Pax, who in his earlier monograph distinguished even two species, *A. microphyllum* with smaller leaves very glaucous beneath and with the petiole shorter than the limb and *A. semiorbiculatum* with larger leaves, green (!) beneath and with the petiole longer than the limb, each species based apparently on a single specimen, collected by Kinn in "Am. bor." without indication of the locality. In his later monograph he reduces the latter species to a form of *A. rubrum* and substitutes for *A. microphyllum* the name *A. tomentosum*.

ARNOLD ARBORETUM.

THE FLORA OF THE GREAT SWAMP OF RHODE ISLAND.

ERNEST SHAW REYNOLDS.

THE Great Swamp of Rhode Island is a region which has long been recognized by botanists as offering a very rich collecting ground, and has often been visited by students of botany. The swamp is located in the southern part of the state, in Washington County, close to the junction of the town lines of Charlestown, Richmond, and South Kingstown. The larger part lies in South Kingstown, though a part of the western half is in the adjoining town of Richmond. It is entirely enclosed between the parallels $41^{\circ} 25'$ and $41^{\circ} 30'$ while the meridian $71^{\circ} 35'$ cuts the swamp area into two nearly equal portions. Excluding the part south of Worden's Pond, the swamp area covers about six square miles, which is the largest tract of land in Rhode Island bearing a swamp flora.